

Unlocking Organizational Potential: Assessing the Impact of Technology through SmartPLS in Advancing Management Excellence

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ABSTRACT

This study aims to explore the organizational potential in facing the impact of implementing Business Intelligence System (BIS) technology using Partial Least Squares Structural Equation Modeling (SmartPLS) as the analytical tool. We conducted research on several organizations that have adopted Business Intelligence (BIS) with the goal of enhancing managerial excellence. Data collection was carried out online, involving 150 respondents from 5 organizations in Indonesia, the majority of whom are already familiar with and have implemented BIS technology in their organizations. We evaluated the impact of this technology, particularly on organizational performance, decision-making processes, and business process optimization. This research not only synthesizes knowledge from relevant literature but also provides a holistic understanding of the impact of Business Intelligence System (BIS) technology, specifically through its success within an organizational context. The findings of this research are expected to offer a profound insight into how the adoption of BIS can transform organizational paradigms in managing information, deciding strategies, and improving operational efficiency.

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1. INTRODUCTION

In the face of the continually evolving digital transformation era, organizations are not only expected to adapt but also to understand, adopt, and optimize technology to enhance their performance[1]. The dynamic nature of the market compels organizations to innovate and adopt the latest technology to improve performance, adaptability, and even energy efficiency[2]. This research is conducted with the primary goal of exploring an organization's potential in responding to the impacts of cutting-edge technology[3].

One technology that has captured the attention of many organizations is Business Intelligence System (BIS)[4]. BIS is not just a data analysis tool but also a key to facing the complexity of business dynamics. The adoption of BIS technology is directed towards enhancing managerial excellence, enabling organizations to respond to market changes more quickly and effectively[5].

This research not only aims to synthesize knowledge from relevant literature but also to provide a holistic understanding of the impact of Business Intelligence System (BIS) technology, especially in the organizational context[6]. Focusing on aspects such as information management, strategic decision-making, and operational efficiency improvement, the research results are expected to provide profound insights into how BIS adoption can shape organizational paradigms, propelling them forward in addressing the demands of change and modern business complexity[7]

It is important to realize that BIS integration is not just a technological transformation but also reflects the cultural and strategic evolution of organizations[8]. Therefore, this research will not only provide insights into the benefits of this technology but also explore how organizations can optimize their potential, respond to challenges, and seize opportunities in this digital era[9].

Therefore, this study poses the following research questions:

RQ1: What is the impact of technology adoption, specifically Business Intelligence Systems (BIS), on various dimensions of organizational performance?

RQ2: How does the utilization of technology, particularly through systems like BIS, contribute to enhancing the quality of decision-making within organizations?

RQ3: In what ways does the adoption of technology, particularly Business Intelligence Systems (BIS), influence and contribute to the optimization of specific business processes?

RQ4: Can a positive correlation be identified between the quality of organizational decision-making and the optimization of business processes, and how is this correlation affected by the adoption of technology, specifically through systems like BIS?

2. LITERATURE REVIEW

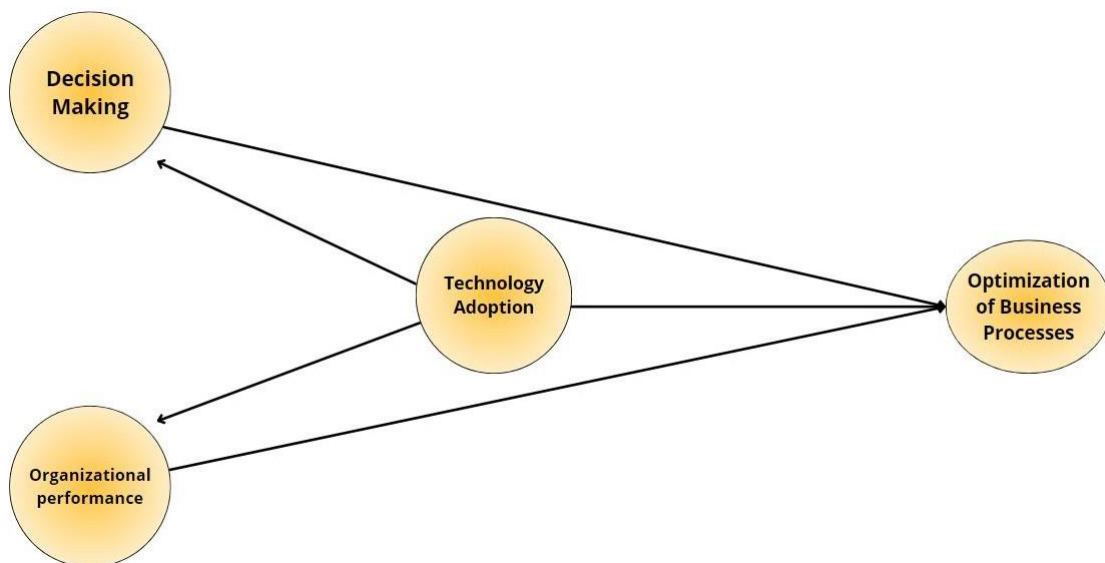


Figure 1. Research Framework

2.1 Technology Adoption and Organizational Performance

In the contemporary business landscape, the role of information technology and information systems has become pivotal in bolstering organizational performance[10]. The primary focus in endeavors to enhance organizational competitiveness and efficiency lies in the adoption of technology, particularly Business Intelligence Systems (BIS)[11]. BIS not only assumes a role in analysis but also encompasses the process of collecting and presenting data to underpin decision-making[12].

Business Intelligence Systems (BIS) go beyond providing insightful analysis, they also streamline the process of collecting and presenting data, supporting well-informed decision-making[13]. Organizational performance indicators, such as the efficiency of the decision-making process and productivity levels, serve as benchmarks for evaluating the positive impact of information technology and information systems[14]. The adoption of BIS technology transcends being merely a technological tool, it is a pivotal element in an organization's strategy to sustain competitiveness. Thoughtful utilization of information technology can foster an environment in which organizations can continually evolve and adapt to market changes[15].

H1: The adoption of technology, particularly Business Intelligence Systems (BIS), demonstrates a positive correlation with organizational performance

2.2 Technology Adoption dan Decision Making

The integration of technology within an organization or company provides valuable insights into the intricate connection between technology adoption and the decision-making process[16]. Numerous studies underscore the direct impact of technology adoption on how organizations handle information and make strategic decisions. Technology, especially through systems like Business Intelligence Systems (BIS), has demonstrated its significant role in streamlining the processes of data collection, analysis, and presentation. Embracing such technology establishes an environment where organizations can access more precise and expedited information, thereby facilitating more informed and timely decision-making[17].

The significance of the correlation between technology and decision-making becomes evident in the shift from traditional decision-making methods to a data-driven approach. Business Intelligence systems empower organizations to dissect data more effectively, recognize trends, and derive insights that bolster intelligent decision-making processes[18]. Moreover, various factors influence technology adoption and its impact on an organization's capacity to make effective decisions. Elements such as organizational culture, structural setup, and the level of management support often act as crucial moderators in the relationship between technology adoption and the decision-making process[19].

In summary, this research emphasizes that technology adoption not only enhances operational efficiency but also profoundly shapes the dynamics of decision-making within organizations[20]. A comprehensive understanding of the interplay between technology and decision-making is crucial for organizations to leverage the full potential of their information technology, enabling them to attain strategic goals and remain competitive in an ever-evolving marketplace.

H2: Technology adoption, particularly through systems such as BIS, has a positive relationship with the quality of decision making.

2.3 Technology Adoption and Optimization of Business Processes

This research underscores the pivotal role of technology application, particularly through systems like Business Intelligence Systems (BIS), in enhancing organizational efficiency, productivity, and adaptability to market changes[21]. When employed judiciously, information technology can bring about substantial transformations in the way organizations strategize, execute, and oversee their business processes. For instance, Business Intelligence Systems not only offer comprehensive analysis of organizational data but also facilitate seamless data integration, expedite workflows, and foster more informed decision-making[22].

Moreover, this study demonstrates that technology application can influence cultural dynamics and drive organizational changes that bolster the optimization of business processes. This transformative process may encompass shifts in employee attitudes toward technology, heightened collaboration across departments, and more strategic utilization of data for decision-making[23].

Furthermore, various studies underscore the significance of a thorough understanding of factors influencing technology adoption and their pivotal role in optimizing business processes. Elements such as supportive leadership, employee engagement, and the alignment of technology with organizational needs emerge as critical factors for successful technology implementation. This illustrates that technology application not only serves as a tool for refining business processes but also functions as a catalyst for broader organizational transformation. A nuanced comprehension of the interplay between technology and business

process optimization empowers organizations to unlock the full potential of their information technology, gain a competitive edge, and swiftly adapt to evolving market demands.

H3: The adoption of technology, particularly through systems such as Business Intelligence Systems (BIS), exhibits a positive correlation with the optimization of business processes.

2.4 Decision Making and Optimization of Business Processes

Optimizing business processes is not merely a procedural step, it holds a pivotal role in shaping the success of an organization. A profound comprehension of several key facets emerges as the linchpin in navigating the complexities of the contemporary business landscape[24].

Primarily, within the realm of decision-making, this literature accentuates diverse theories and models that underpin decision-making processes at both individual and organizational levels. Business decisions encompass resource allocation, strategic formulation, and responses to market changes. This study proves instrumental in identifying factors influencing business decisions and formulating strategies to enhance decision-making quality[25].

Furthermore, this research zeroes in on the optimization of business processes, delving into how an organization can bolster efficiency, productivity, and responsiveness through the refinement and adjustment of operational processes. The incorporation of technology, particularly Business Information Systems (BIS), in automation and data analysis becomes an integral facet of endeavors aimed at enhancing business processes.

With a comprehensive approach, this literature investigates how intelligent decision-making contributes to augmenting the efficiency of business processes[26]. Decisions rooted in data analysis and a profound grasp of company operations become instrumental in attaining optimization objectives. In this context, artificial intelligence and predictive analytics technologies take center stage, offering invaluable insights to facilitate improved decision-making. Moreover, the research may encompass case studies featuring organizations successfully integrating intelligent decision-making with business process optimization. An analysis of best practices and lessons gleaned from innovative implementations imparts practical insights for other organizations aspiring to enhance their performance.

Through an intricate exposition of theories, models, best practices, and cutting-edge technology, this research provides a comprehensive perspective on strategies that can empower organizations to achieve success through sound decision-making and optimal operational efficiency.

H4: There exists a positive correlation between the quality of organizational decision-making and business process optimization.

2.5 Organizational Performance and Optimization of Business Processes

Organizational performance, serving as an indicator of the degree to which company objectives are realized, is intricately linked to the optimization of business processes within the organization. As the intricacies of the business landscape intensify, the optimization of business processes emerges as a pivotal factor for enhancing operational efficiency, curtailing costs, and ensuring the attainment of company targets. The streamlined optimization of business processes can yield a positive impact across various dimensions, encompassing heightened employee productivity, elevated product or service quality, and, ultimately, augmented customer satisfaction. Consequently, an in-depth comprehension of the nexus between organizational performance and the optimization of business processes proves indispensable for corporate leaders striving to attain operational excellence and foster long-term sustainability.

Within the scope of this research, it is posited that a positive correlation exists between the level of business process optimization and organizational performance. This postulation implies that as a company adeptly manages and optimizes its business processes, the overall organizational performance is likely to ascend. Furthermore, the hypothesis asserts that companies undertaking business process optimization will demonstrate superior organizational performance compared to their counterparts that have not embraced this practice. Through the empirical testing of this hypothesis via research and the scrutiny of pertinent data, we aspire to unearth profound insights into how the interplay between business process optimization and organizational performance can significantly shape the competitive edge and sustainability of a company.

H5: There exists a positive correlation between the degree of Optimization of Business Processes and Organizational Performance.

2.6 SmartPLS (Smart Partial Least Square)

SmartPLS, an abbreviation for Smart Partial Least Squares, is a statistical analysis method employed in empirical research to examine and assess relationships among variables within structural models. Through the integration of the Business Intelligence System via SmartPLS, this methodology facilitates the identification of relationships and impacts among these variables, while also streamlining the validation of resulting hypotheses. This analytical approach aids in precisely identifying the factors with the most significant influence.

The implementation of SmartPLS in this research provides a profound understanding of how Business Intelligence Systems influence the optimization of business processes and contribute to organizational success. The analysis conducted with SmartPLS enhances comprehension of the intricate relationships among these factors, assisting in pinpointing key aspects that can be optimized to enhance the operational and strategic performance of an organization.

3. RESEARCH METHOD

This research employs a quantitative approach and specifically focuses on the analysis of organizations that have implemented technology, particularly Business Intelligence Systems (BIS), to enhance managerial excellence. Data collection was conducted online, involving 150 respondents from five organizations in Indonesia. The majority of respondents are acquainted with and have integrated BIS technology into their organizational operations. Data were gathered through a structured questionnaire, utilizing a scoring scale ranging from 1 to 5.

The primary objective of this research is to assess the impact of technology adoption on Business Process Optimization. Utilizing the Smart PLS analysis method, this research empirically examines the relationship between variables, such as Technology Adoption, which gauges the extent to which an organization has adopted and integrated technology, particularly BIS, into its operational activities. This analysis aims to predict the repercussions of technology adoption, ultimately influencing organizational performance in both the aspects of Organizational Performance and Decision Making

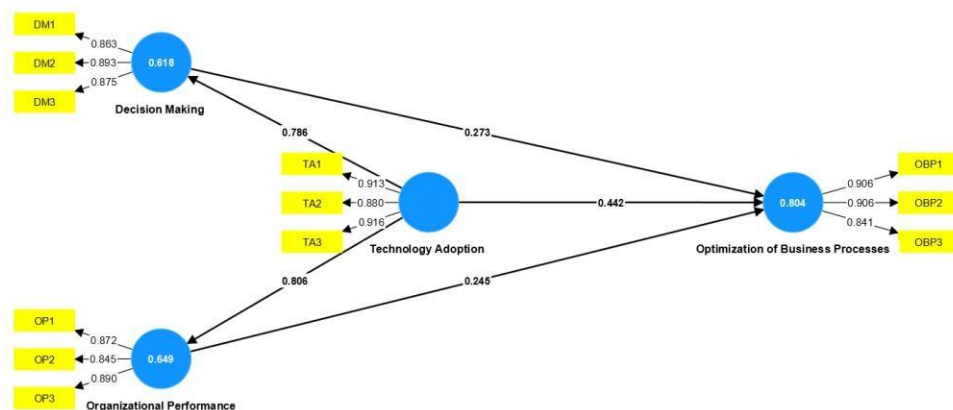


Figure 2. Conceptual Model

3.1 Measurement Model

To evaluate the reliability of the construct within the scope of this research, two evaluative experiments were undertaken. This assessment is grounded in two primary validity types convergent validity and discriminant validity. Convergent validity is tailored to verify that the observed variables exhibit a substantial correlation with the associated research object. The purpose of this validity examination is to affirm the extent of the relationship between these variables within the construct framework under evaluation.

Furthermore, discriminant validity tests were executed to substantiate that items originating from distinct variables did not demonstrate a noteworthy relationship with each other. In essence, this test aims to ensure that the variables under scrutiny genuinely represent disparate dimensions or concepts and do not merely mirror a single analogous aspect.

The initial action undertaken by the researcher involved conducting measurements on the model to assess its validity and reliability. The Average Variance Extracted (AVE) value serves as an indicator to gauge the degree to which an indicator correlates positively with other indicators, and it is deemed satisfactory if it surpasses > 0.5 . Furthermore, a loading factor value is deemed acceptable if it exceeds > 0.7 . While an AVE value above 0.5 is deemed adequate, a value ranging from 0.5 to 0.7 is still considered suitable for further investigation.

Table 1. Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Decision Making	0.850	0.852	0.909	0.769
Optimization of Business Processes	0.861	0.872	0.915	0.783
Organizational Performance	0.838	0.839	0.903	0.756
Technology Adoption	0.887	0.889	0.930	0.816

The Average Variance Extracted (AVE) values obtained in this study were 0.769, 0.783, 0.756, and 0.816. Each of these values surpasses the commonly accepted AVE threshold of 0.5. These findings affirm that all the constructs under examination have effectively demonstrated convergent validity, implying that the utilized indicators exhibit strong and consistent correlations with one another.

3.2 Discriminant Validity

Table 2. presents the outcomes of the discriminant validity assessment employing the Fornell-Larcker Criteria. To satisfy this criterion, Fornell-Larcker stipulates that the square root of each AVE component must exceed its highest correlation with any other construct.

Table 2. Discriminant Validity

	Decision Making	Optimization of Business Processes	Organizational Performance	Technology Adoption
Decision Making	0.877			
Optimization of Business Processes	0.829	0.885		
Organizational Performance	0.823	0.827	0.869	
Technology Adoption	0.786	0.853	0.806	0.903

An examination of the research findings presented in Table 2. suggests that the correlation within each latent construct surpasses the correlation between latent constructs that stem from different constructs. Consequently, it can be inferred that each variable in this study holds a high level of significance regarding accuracy and validity. In other words, all constructs adhere to the established standards.

The analysis focused on four constructs: Decision Making (DM), Optimization of Business Processes (OBP), Organizational Performance (OP), and Technology Adoption (TA). The findings indicate that the Average Variance Extracted (AVE) value for each construct surpasses the correlation between the respective constructs. Specifically, the AVE for Decision Making is 0.877, exceeding correlations Optimization of Business Processes (0.829), Organizational Performance (0.823), and Technology Adoption (0.786). Similarly, the AVE for Optimization of Business Processes is 0.885, surpassing correlations with Organizational

Performance (0.827) and Technology Adoption (0.853). Additionally, the AVE for Organizational Performance is 0.869, correlating with Technology Adoption (0.806). Lastly, the AVE for Technology Adoption is 0.903, indicating a higher value than its correlation with Decision Making (0.786), Business Process Optimization (0.853), and Organizational Performance (0.806). These results demonstrate that each variable effectively captures a significant amount of distinct variation from one another.

3.3 Outer Model Evaluation

Table. 3 R-Square

	R-square
Decision Making	0.618
Optimization of Business Processes	0.804
Organizational Performance	0.649

Table 3. presents the R-square values for three distinct groups, Decision Making (0.618), indicating approximately 61.8%; Optimization of Business Processes (0.804), achieving 80.4%; and Organizational Performance (0.649), representing roughly 64.9%. These R-square figures underscore the efficacy of the regression model in elucidating the factors influencing Readiness to Change and Job Engagement within the context of this study.

Table. 4 Statistical Hypothesis Testing Results

	Original sample (O)	T statistics (O/STDEV)	P values	Decision
Decision Making -> Optimization of Business Processes	0.273	2.515	0.012	Supported
Organizational Performance -> Optimization of Business Processes	0.245	2.287	0.022	Supported
Technology Adoption -> Decision Making	0.786	11.356	0.000	Supported
Technology Adoption -> Optimization of Business Processes	0.442	4.476	0.000	Supported
Technology Adoption -> Organizational Performance	0.806	14.995	0.000	Supported

Table 4. reveals that each of the examined relationships (DM > OBP, OP > OBP, TA > DM, TA > OBP, and TA > OP) demonstrates statistical significance, as evidenced by the initial sample values (falling between 0.245 to 0.806), elevated T statistics (ranging from 2.287 to 14.995), and P values of 0.022, 0.012, and 0.000. Each hypothesis presented in the table receives support.

4. RESULTS AND DISCUSSION

The findings of this research encompass various crucial aspects, such as the reliability of constructs, discriminant validity, R-square values, and the outcomes of statistical hypothesis tests. Specifically, the scrutinized constructs Decision Making (DM), Optimization of Business Processes (OBP), Organizational Performance (OP), and Technology Adoption (TA) demonstrate robust reliability and validity. The Average Variance Extracted (AVE) value surpasses the accepted threshold of 0.5, signifying substantial convergent validity. Furthermore, discriminant validity is established by correlations within each latent construct exceeding those between different constructs, thereby reinforcing the significance and precision of each variable.

The examination of AVE values underscores the distinctiveness of each construct, with Decision Making (0.877), Optimization of Business Process (0.885), Organizational Performance (0.869), and Technology Adoption (0.903) capturing significant unique variations. R-square values offer insights into the efficacy of the regression model, indicating that Decision Making, Business Process Optimization, and Organizational Performance explain approximately 61.8%, 80.4%, and 64.9% of the variation, respectively.

Furthermore, the results of statistical hypothesis testing, detailed in Table 4, affirm the significance of the relationships ($DM > OBP$, $OP > OBP$, $TA > DM$, $TA > OBP$, and $TA > OP$). The statistical significance is evident in the sample values, high T statistics, and low P values (0.022, 0.012, and 0.000), providing robust support for each hypothesis.

5. CONCLUSION

This research comprehensively explores organizations' capacity to navigate the impacts of cutting-edge technology, with a specific emphasis on the adoption of Business Intelligence Systems (BIS). The findings demonstrate that the adoption of technology, particularly through BIS, exhibits a substantial positive correlation with organizational performance, the quality of decision-making, and the optimization of business processes.

An examination of construct reliability, discriminant validity, and R-square values allows for the overarching conclusion that each variable under scrutiny Decision Making (DM), Optimization of Business Process (OBP), Organizational Performance (OP), and Technology Adoption (TA) exhibits robust reliability and validity. This is underscored by the Average Variance Extracted (AVE) values exceeding the 0.5 threshold, indicating strong convergent validity and met discriminant validity.

Further scrutiny accentuates the distinctiveness of each variable, as evidenced by AVE values reflecting significant variations. Decision Making (0.877), Optimization of Business Process (0.885), Organizational Performance (0.869), and Technology Adoption (0.903) successfully capture substantial unique variations. Moreover, the R-square value signifies the effectiveness of the regression model in elucidating factors influencing readiness to change and engagement in work.

Consistently, the results of statistical hypothesis testing support a positive relationship between the variables, affirming that BIS adoption effectively contributes to organizational performance enhancement, improved decision-making quality, and optimized business processes. This implies that BIS integration transcends mere technological transformation, encapsulating the evolution of organizational culture and strategy in response to the demands of the digital era. These conclusive insights provide a robust foundation for organizational leaders to comprehend and leverage technology's potential in addressing challenges, adapting to change, and exploring opportunities in the ever-evolving digital landscape.

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